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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,098	04/07/2004	Falgun D. Patel	10030458-1	8269
57299	7590	03/16/2006		
AVAGO TECHNOLOGIES, LTD. P.O. BOX 1920 DENVER, CO 80201-1920			EXAMINER HUGHES, DEANDRA M	
			ART UNIT	PAPER NUMBER
			3663	
DATE MAILED: 03/16/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/820,098	PATEL ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Deandra M. Hughes	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 03 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 13-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election without traverse of Invention I-Species A in the reply filed on 2/3/06 is acknowledged. Accordingly, claims 13-20 are withdrawn.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Duling (US 2003/0147127 filed Nov. 25, 2002).

With regard to claim 1, Duling discloses an optical element, comprising:

- a loss element having a signal loss (e.g. fig. 3, #320b);
- and a rare earth doped gain element (e.g. #320a, paragraph [0045]) optically connected in series with the loss element (element #320b and #320a are serially connected);
- the rare earth doped gain element operable to produce a signal gain (amplifiers impart gain);
- in which the signal gain and the signal loss are about equal (fig. 2a and fig. 2b which result in fig. 3c).

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Since Duling discloses all of the structural elements of the claimed invention, the Examiner has reason to believe that the optical element is an optical switch.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Varner (US 6,603,909 filed Nov. 5, 2001) in view of Becker et al. (Erbium-Doped Fiber Amplifiers and Technology, 1999).

With regard to claim 1, Varner discloses an optical element, comprising:

- a loss element having a signal loss (e.g. fig. 9c, section of #950 between #990 and #960);
- and a rare earth doped gain element (e.g., section of #950 between #960 and #930) optically connected in series with the loss element (the 1<sup>st</sup> section of #950 and the 2<sup>nd</sup> section of #950 are serially connected);
- the rare earth doped gain element (col. 5, line 10; Erbium is a rare-earth) operable to produce a signal gain (amplifiers impart gain).

Varner does not specifically disclose that the signal gain and the signal loss are about equal. As it is well-known in the art, Becker teaches gain control

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of an EDFA via pump power control (e.g. see fig. 6.3). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to adjust the pump power of the Varner's pump (#910) so that signal gain equals signal loss for the advantage compensating for signal attenuation thereby ensuring reception at the receiver.

With regard to claim 6, the loss element (#950) is a Er-doped waveguide.

6. Claims 2-3, 7-8, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Varner (US 6,603,909 filed Nov. 5, 2001) in view of Becker et al. (Erbium-Doped Fiber Amplifiers and Technology, 1999) as applied to claim 1 above, and further in view of LaBorde (US 5,475,528 published Dec. 12, 1995).

With regard to claims 2-3 and 8, Varner in view of Becker does not specifically disclose doping the core with at least 5 wt% of erbium. However, this is well known in the art, as is taught by LaBorde (e.g. see Abstract). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to dope the gain element with at least 5 wt% of erbium for the advantage of increasing pump power conversion.

With regard to claim 7, rare earth doped amplifiers inherently operate according to stimulated emission.

With regard to claim 12, the amplifying fiber of Varner (#950) can only impart gain to the signal via the pump signal. If the pump is not coupled to the amplifier, then it cannot impart gain. Consequently, the gain element is inherently in the on state when the pump power is coupled to the gain element.

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7. Claims 4 and 9-10 rejected under 35 U.S.C. 103(a) as being unpatentable Varner (US 6,603,909 filed Nov. 5, 2001) in view of Becker et al. (Erbium-Doped Fiber Amplifiers and Technology, 1999) as applied to claim 1 above, and further in view of Hayden (US 6,430,349 published Aug. 6, 2002).

With regard to claims 4 and 9, Varner in view of Becker does not specifically disclose that the rare-earth ion comprises  $\text{Er}^{3+}$  and  $\text{Yb}^{3+}$  in the range of 5 to 75 wt%. However, Hayden teaches doping with  $\text{Er}^{3+}$  and  $\text{Yb}^{3+}$  in the range of 5 to 75 wt% (col. 4, lines 20-25). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to dope the fiber as is taught by Hayden for the advantage of optimizing the gain profile to the signal bandwidth.

With regard to claim 10, Varner in view of Becker does not specifically disclose doping the core with silver atoms. However, Hayden teaches doping the core with silver atoms (col. 5, line 1). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to dope the core with silver for the advantage of a sensitizing agent.

8. Claims 5 and 11, as best as they are understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Varner (US 6,603,909 filed Nov. 5, 2001) in view of Becker et al. (Erbium-Doped Fiber Amplifiers and Technology, 1999) as applied to claim 7 above, and further in view of Nilsson (US 2002/0030881 filed Aug. 7, 2001).

Varner in view of Becker does not specifically disclose that the cladding is doped with a rare earth ion. However, Nilsson teaches doping a cladding with a

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rare earth ion (paragraph [0040]). It would have been obvious to one of ordinary skill (e.g., an optical engineer) in the art at the time the invention was made to dope the cladding with a rare earth ion for the advantage of optimizing the gain profile to the signal bandwidth.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 5 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5 and 11 recites the limitation "the cladding" in line 1. There is insufficient antecedent basis for this limitation in the claim. *Is it the cladding of the loss element that is doped or is the cladding the gain element doped?*

***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sigematsu, Castoldi, and Aleksandrov disclose optical amplifying switching devices.


12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deandra M. Hughes whose telephone number is 571-272-6982. The examiner can normally be reached on M-F, 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on 571-272-6878. The fax

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phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Deandra M Hughes  
Examiner  
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